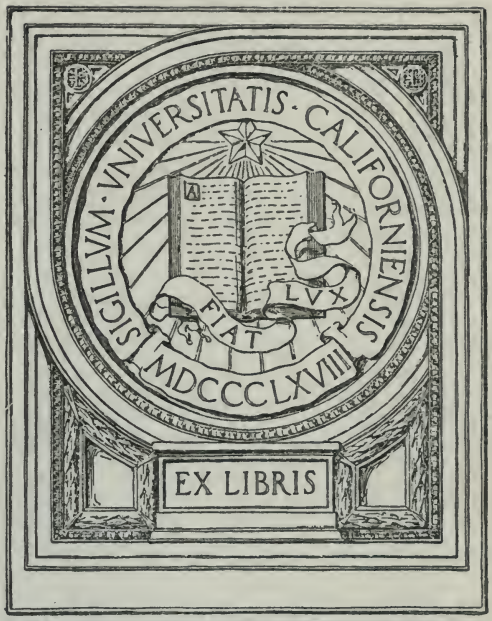
STAMMERING
CLEFT-PALATE SPEECH
LISPING

K. EMIL BEHNKE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BEHNKE'S

STAMMERING, CLEFT-PALATE SPEECH, LISPING

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SECOND EDITION, REVISED AND ENLARGED BY

KATE EMIL-BEHNKE

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PREFACE

THE last edition of the treatise on "Stammering, Cleft-Palate Speech, and Lisping" by my parents being exhausted, it has seemed desirable to revise and amplify it, adding thereto the results of my own work in carrying on the method which has been so successful over a period of some forty years in the treatment of stammering, defects of speech, and the training of the voice for speaking and singing.

I wish to express my thanks to the medical profession, to the Press, and to the public generally, for the support and for the approbation of the method which they have so frequently and generously expressed.

KATE EMIL-BEHNKE.

39, EARL'S COURT SQUARE, S.W. 5.
September, 1922.

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PART I

BY EMIL-BEHNKE

A reprint of a paper on "Stammering: Its Nature and Treatment" read before the South Wales Branch of the British Medical Association, and before a medical gathering at the Central London Throat, Nose, and Ear Hospital.

PART I

STAMMERING

Definition

The terms *stammering* and *stuttering* are regarded by some authors as interchangeable, implying the same thing. Others insist strongly upon the necessity of distinguishing the one from the other, as implying two entirely different things.

My own definition is this:

Stammering and stuttering are impediments of speech, consisting of spasmodic, or entirely suspended, action of any part or parts of the vocal apparatus, from the diaphragm to the lips.

Stammering is a defect in the utterance of consonants, rather than in the utterance of vowels.

Stuttering is a defect in the utterance of vowels, rather than in the utterance of consonants.

Both impediments are frequently found in the same person, and both are due to the same cause—inability to vocalise. The two terms may, therefore, be considered as interchangeable.

If a *stammerer* wants to say *pa*, he has a kind of

lockjaw, and cannot get the consonant *p* out at all. This feat once accomplished, he generally has no difficulty in adding the vowel to the consonant. But he may be equally fixed in trying to utter a word commencing with a vowel, when, in spite of widely-opened mouth, no sound will be forthcoming.

If a *stutterer* wants to say *pa*, the case is exactly reversed. He has no difficulty in articulating the consonant *p*, which, on the contrary, he repeats over and over again with astonishing rapidity; *his* difficulty consists in adding the *vowel* to it. But it is by no means uncommon for a stutterer to go through the same process of repetition when trying to pronounce a word commencing with a vowel.

It will thus be seen that the defects of speech called *stammering* and *stuttering* overlap, and it is not too much to say that in many, if not in most, instances, the one accompanies the other. The question whether a given case is one of stammering or of stuttering is therefore, in my opinion, more theoretical than practical, and I shall consequently, in order not unnecessarily to complicate matters, always use the term *stammering* to include both impediments.*

* "Mr. Behnke sets aside this refinement of onomatopœia and asks us, we think judiciously, to employ the term *stammer* for both, thus simplifying the matter at the onset, as the conditions are often identical and their differences quite non-essential."—*Journal of Laryngology*, July, 1891.

Mere indistinctness of speech, lisping, the burred *r*, the misplaced *h*, the defective *l*, *g*, or *k*, the substitution of *w* for *r*, of *b* for *m*, or of *d* for *n*, etc., do not come under the head of stammering in any sense of the word. Their causes are local, they are clear and unmistakable. The causes of *stammering*, on the other hand, are *not* local, but must be sought in disturbed action of the nervous centres concerned in the production of speech. If speech is to be perfect, there must be harmonious co-operation of the several mechanisms of respiration, phonation, and articulation, all of which are known to be under the direct and immediate influence of that portion of the brain which is known as the "bulb," or the "medulla oblongata," where the centres of these mechanisms are situated close together.

Spasm in these nervous arrangements may occur, and does occur, without any gross material lesion of the structure of the bulb, from disturbed molecular action simply; and this circumstance enables us to understand why special training of the affected nervous centre, with the view of inducing harmonious action of the three mechanisms concerned in speech, may succeed in overcoming the habit of stammering in a large number of cases, provided there are no local or general complications which would render a cure by elocutionary treatment alone impossible.

Warning

A general notion prevails that a child will "grow out" of stammering, and in some instances the impediment does indeed diminish as the powers of reflection and of self-control increase with maturer age. But in the vast majority of cases the child will no more grow out of stammering than it would grow out of a physical deformity; the impediment will, on the contrary, increase, and become more and more intractable.

If stammering is attended to when first it shows itself, it may be prevented, and as prevention is proverbially better than cure, parents ought to be watchful of their children from infancy.

What shall we say of parents who are thoughtless and indifferent enough not only to *neglect* the first traces of stammering, but who even foster and aggravate the impediment by laughing at the little sufferer and by mimicking him? A mother who was in the habit of doing this once said in my hearing to her little boy: "Ch-arlie, will you have s-s-some c-c-cake?" Is it to be wondered at that Charlie replied: "P-p-please, m-m-mother"? And is it surprising that his younger sister, as soon as she was old enough to talk, also commenced to stammer? Charlie acquired the impediment by unconsciously imitating his father, from whom both children probably inherited a predisposition. Baby,

after the father's death, acquired it by unconsciously imitating Charlie, and the mother, by her folly, perpetuated the defect. It is a sad picture, but not, I am afraid, a unique one.

In another case which came under my notice, a mother who was a strict disciplinarian of the old school, now happily fading out of existence, looked upon the stammering of her little boy as the result of obstinacy or carelessness, and thrashed him accordingly. It is needless to say that he grew morose, sullen, and resentful; his speech became worse, and his whole character was ruined.

I am not here concerned with the way in which children should be treated in general, but only in reference to my special subject, and I say emphatically that parents should, upon the very first indication of an impediment of speech, display the greatest loving-kindness, and exercise the most patient and untiring perseverance in order to counteract and to correct any hesitation or stumbling.

Much mischief is also frequently done by school teachers, who, by indifference, impatience, and want of sympathy, intensify the impediment of a stammering boy, and thus unwittingly make his young life a misery. The poor boy, although knowing his lesson perfectly, cannot give a ready utterance to it, and the teacher passes him over with a cruel "Oh, I have not time to wait for you! Next boy!"

Just a few words about the teasing, the bullying, and the mimicking that a stammerer is frequently subjected to by his companions. Boys will be boys, of course, and we cannot expect from them the thoughtfulness which comes with maturer age; but they are naturally generous, and a headmaster with his heart in the right place will have little difficulty in showing them the cowardice of making fun of an affliction which is often worse than a curvature of the spine, though it may, to those without understanding, appear but a trifling matter. Should, however, the appeal to their higher nature fail, then the offenders must be sternly dealt with as would be the bully who torments a little fellow who is incapable of defending himself.

Causes of Stammering

In order to ascertain the causes of stammering in any given case, we have to inquire into it (*a*) from a pathological, (*b*) from a mental, and (*c*) from an elocutionary point of view. But although I propose, for the sake of convenience, to discuss the subject under these heads, it must ever be borne in mind that, so far from any of these different aspects being clearly defined in actual cases of stammering, they are, as a rule, inextricably mixed up with each other; and it is this circumstance which often makes it so difficult to grapple with the evil.

Pathological Aspect

I heard some time ago a lecture by a gentleman who advertises himself extensively as a curer of stammering, in which he asserted that the more he had to do with stammerers the more he became convinced that there was nothing the matter with them physically, that their difficulty was entirely elocutionary, and that they could be completely cured by elocutionary treatment alone. *I deny this* in toto, *and assert, on the contrary, that there are very few cases of stammering indeed in which there is no necessity for medical aid before elocutionary treatment can be of the slightest avail.* Thus it is absolutely necessary first to treat any affections of the mouth or throat, or any general morbid condition of the system which may be present, and which may be exciting causes of stammering, or may aggravate pre-existing habitual stammering. Stammering is, indeed, sometimes entirely due to such nervous affections as epilepsy, hysteria, or locomotor ataxy, in which mere voice-training could not, in the nature of things, be expected to lead to any useful result, as in such cases the speech difficulty is but a symptom of a graver disorder. It is chiefly in the hope of calling the attention of medical practitioners to this matter, and of exciting their interest in it, that I have undertaken to write

this paper, and will venture to relate to you a few of my experiences, from which you will draw your own conclusions.

CASE I. is that of a young girl whom I had known for some years before her mother brought her to me with regard to an impediment of speech. She was very tall, very thin, easily fatigued, unable to sit upright, constantly desirous of lying down. I gave her a few lessons, but was dissatisfied with the result, and advised her mother to have her thoroughly examined by a medical practitioner. It was then discovered that she had slight lateral spinal curvature, for which she underwent treatment for a considerable time. Some years have passed since then, and not only has the spinal weakness been overcome and her health fully established, but the elocutionary exercises, which she has since resumed, have rapidly produced the desired effect, so that she has now lost her impediment completely and is able to gratify her wish to go on the stage. In this case, without doubt, the original cause of the stammering was debility of her nervous system, due to spinal affection.

CASE II. is that of the son of a medical man. The boy's naso-pharyngeal passages were obstructed by adenoid growths, which were diagnosed by the specialist to whom he was taken to be the cause of the impediment. The child was first operated upon,

and then sent to me, and, as a result of this preliminary treatment, I was enabled to effect a cure, which I am convinced I could not have done otherwise.

The surgeon who sent the patient to me furnished me with the following explanation of the case:

"The boy's respiration through the natural passages was impeded, and as a result he had one, if not all, of several conditions. First, his lungs were not sufficiently aerated, and a vicious, inefficient, and jerky respiration resulted. This in turn led either to general venous congestion, implicating the brain, and so causing the boy to be neurotic, and in addition, to use a new word, aprosectic, which here signifies that he had not the power to pay proper attention to his speech-education; or it may, as it often does, also have impaired his hearing, not necessarily of ordinary sounds, but of the appreciation of the refinements of speech; and, lastly, actual congestion of the organs of voice and speech may have arisen which mechanically impeded them."

Case III. is that of a young man who was addicted to masturbation. This had been recognised by his medical adviser, but denied by the patient. The pupil had not, however, been in my house many days before I was convinced that his doctor's suspicions were justified.

Of the good effects of surgical treatment for this condition as a preliminary to speech treatment I have at the present an example under my care.

If there is any reason to suspect that this practice is being carried on by stammerers of either sex, the family physician's advice should be sought as to the best means of dealing with the matter.

Other points of irritation besides those just mentioned are nasal polypus, deflected septum, or any other nasal blockage, enlarged tonsils, elongated uvula, decayed teeth, intestinal worms, etc.

Having thus insisted that it is in most instances impossible for the treatment of stammering to progress satisfactorily and thoroughly without medical aid, or at least without preliminary medical inspection and authoritative assurance as to absence of constitutional cause, I must also express my conviction that the cure of stammering by medical treatment alone, unassisted by elocutionary aid, is equally impossible; *it cannot create new habits of speech*. These have to be carefully and patiently formed by the teacher.

Mental Aspect

A stammerer, when alone or in company with intimate friends, can frequently talk as easily and fluently as persons not afflicted; yet the moment he has to address a stranger his power of utterance is

impeded, or even completely suspended. Here we have incontestable proof that his organs of speech are perfectly normal, and that his difficulty is not physical but mental.

Amongst mental causes of stammering may be mentioned timidity, shyness, distrust, fear of ridicule, eagerness, impatience, excitement, envy, and irritation. A person may even stammer in his thoughts in consequence of flightiness and for want of concentration; this will of necessity be reflected in his speech. Such cases are generally put down to nervousness, which, however, may in some circumstances be not the cause but the result. I say advisedly that these cases of nervousness in which the physician has been unable to detect an objective cause are essentially those to be treated by the skilled and patient teacher, and that they can neither be alleviated by tonics nor by general gymnastics.

The instructor must first of all gain the most absolute confidence of, and influence over, his pupil, and then lead him into habits of calmness, of deliberation, and of self-reliance.

It is also important to divert the sufferer's mind from his impediment, for the more he concentrates his attention upon it, the more will his difficulty increase. To this end it is sometimes useful to direct the stammerer to accompany each troublesome syllable by some slight movement of a finger,

the hand, or the foot, etc., as enforced by the late Canon Kingsley, thereby diverting his attention from the effort to speak to the performance of a muscular action, and his impediment is often entirely, though only temporarily, removed. This is one of the remedies forming the stock-in-trade of so many so-called stammer-curers, who indiscriminately apply it to all cases, and it has consequently fallen into considerable disrepute. Nevertheless, it has its legitimate uses, and will, judiciously employed, sometimes be of considerable assistance. It is, however, nothing more than a device, to be used temporarily, until the stammerer has by systematic training obtained control over the muscles of respiration and articulation.

Elocutionary Aspect

This section may be best commenced by a consideration of the question whether it is possible to form an opinion as to the chances of success or otherwise in undertaking the treatment of any particular case. The matter having been considered in its pathological and mental aspects, I am now only looking at it from an elocutionary point of view, and experience has taught me to divide my cases into two classes—viz., those in which the difficulty can be traced to the management of the bellows, and those in which it cannot. To illustrate: A patient

presents himself who stammers badly. When trying to say the alphabet, he can scarcely pronounce a single letter, and upon endeavouring to reply to questions put to him, his whole body is thrown into violent contortions, so that it is positively painful to look at him. I now place him on a couch, flat on his back, comfortably raising his head on a pillow, and then give him some diaphragmatic drill. As soon as he has acquired sufficient control over the diaphragm, I direct him once more to say the alphabet, taking a very short inspiration before each letter by *contracting* the diaphragm, and then attacking the letter by *relaxing* the diaphragm. I control these movements by holding my hand on his abdomen, and he now, to the amazement of friends who may have accompanied him, pronounces every letter as quietly and as easily as they could do themselves. In these circumstances I am always confident of success; cure is certain, provided I have the patient under my absolute control, and that sufficient time be allowed.

If, on the other hand, the impediment is as great in the circumstances just described as it was before, I am doubtful of success; and I must, in such cases, rely upon what I may call local remedies instead of being able to devote myself to the removal of the fundamental difficulty. The cases in which the speech trouble can be traced fundamentally to the

management of the breath are, fortunately, in the vast majority, and the results obtained by training a patient to manage his voice by means of diaphragmatic action are sometimes almost miraculous.

The following case illustrates my point. The Rev. H. H. suffered from spasm of the glottis to such an extent as to make speaking almost impossible, while his efforts were painful both to hear and to see. He had been for years under medical treatment, and had by advice resided for five years abroad, without beneficial result. Upon putting him to the test just described, I found that his difficulty, for the time being, entirely disappeared, and I came to the conclusion, therefore, that the real seat of the trouble was in the diaphragm, and that the spasms in the glottis were merely reflex action. I treated him accordingly, and after a very short course of treatment received from him the following letter: "I am sure you will be pleased to hear that last Sunday evening I preached in —— Cathedral in the nave, and was heard perfectly throughout the whole building, both in the choir and down to the end of the nave. People have remarked what a strong voice I have! With God's blessing, I owe this to your skill."

There are some authors who consider that lateral, or purely costal, breathing may be exercised without diaphragmatic action. Assuming this to be pos-

sible, the effort involved would in itself render it undesirable for stammerers; and, moreover, inflation which is commenced by lateral expansion is exceedingly liable to degenerate into clavicular breathing.

The question may be asked why diaphragmatic breathing should have such beneficial influence upon the propulsion of the voice. To this a variety of replies may be given. The chief reason, in my judgment, is that by clavicular breathing we set in motion machinery which is unyielding and clumsy, owing to the bony structure of the upper part of the thorax, and over which it is therefore impossible to get easy and delicate control; while the diaphragm exercises muscular force on that portion of the chest walls which is surrounded only by soft and yielding parts, and which can therefore be trained to act with the utmost certainty and precision.

It is a very common fault with stammerers to try to speak with empty lungs; they let out all the air they can dispose of, and then try to speak; which is, of course, a hopeless task. In such circumstances the patient has to be taught economy of breath, which, after having gone through the necessary diaphragm drill, is a comparatively easy matter. But stammerers attempt as frequently to speak with unduly distended lungs, which is just as fatal to an easy and smooth delivery; and this is a fact which

does not, I think, receive the attention it deserves. To counteract this habit it is necessary to train the patient to breathe more lightly and more frequently than he has been accustomed to do.

Phonation Drill

This depends primarily, so far as the larynx is concerned, upon the action of the adductors, or closing muscles of the vocal cords. If these did not act at all, no production of tone would be possible, however perfect the remainder of the vocal apparatus might be, and it is quite clear, therefore, that if they act with uncertainty the voice will be produced with uncertainty. If they act smartly and promptly the voice will be produced smartly and promptly. It is necessary, therefore, to educate these muscles in order to insure the proper attack of tone commonly called the "shock of the glottis." This is accomplished by directing the stammerer to sing a number of *staccato* tones, each one preceded by a short inspiration. For *each intake of breath,* which is the motor element, the *ab*ductors, or opening muscles, separate the cords and open the glottis, and for every *tone,* however short, the *ad*ductors, or closing muscles, by causing approximation of the cords, close the glottis; and these smartly and frequently repeated movements have the effect, not only of strengthening the opening and closing muscles of

the glottis, but also of increasing the patient's control over them.

Similar drill should be applied to the soft palate, the influence of which upon the voice is much greater than most people who have not paid special attention to the subject have any conception of; and it should be remembered that, in the case of adenoids, enlarged tonsils, elongated uvula, etc., conditions so often present in the stammerer, the soft palate has been rendered paretic by an over-weighting of the muscles. Not only is nasal quality prevented by proper action of the soft palate, but the *resonance* of the voice depends upon it to an enormous extent, and it may be seen in a well-managed throat to move like something sentient, and to occupy a distinctly different position at every different pitch at which a tone is produced. Control over the soft palate also confers the invaluable power of breathing through the nostrils while speaking and singing, thereby preventing dryness of the mouth and the throat, of which so many voice-users complain.

We now come to a description of some of those methods alluded to for the cure or alleviation of stammering in cases where the difficulty cannot be traced to the breathing apparatus. Much of a stammerer's trouble arises from the fact that he involuntarily exaggerates all the stops and checks

taking place in the vocal apparatus from the glottis to the lips, which are involved in speech. The more he exaggerates these stops and checks the greater will be his difficulty to overcome their resistance, and he must, therefore, be trained to make these closures as shortly and lightly as possible. In this matter we are assisted by the drill of the soft palate, and I have also devised special exercises for the tongue and the lips which greatly assist the stammerer in the management of his articulation apparatus.

It is a well-known fact that most stammerers can sing without any difficulty. This is because in singing there is a continuous flow of the vocal tone; *the vowels predominate*, while the consonants are but lightly touched in passing. The opposite of this takes place in speech. The vowels are passed over quickly, and *the consonants*, which are only checks, clicks, and explosive noises, *predominate*. The moral of this is obvious. Let the stammerer *exaggerate his vowels* at the *expense of his consonants*, and a good many stumbling-blocks will thereby be removed from his path.

It is equally easy for most stammerers to whisper, and this teaches a great lesson with regard to the difficulty they so often experience in the *attack of vowels* in speech. In *whispering* the glottis is *open*, in *phonation* it is *closed*. The air passes out of the

open glottis without let or hindrance, and *this act should precede the closing of the glottis for phonation*, when the production of a vowel will be an easy matter. In other words, the attack of a vowel should, in case of difficulty, never be sharp or sudden, but it should be *preceded by a short aspirate*. To put it differently, the *glide* of the glottis should be substituted for the *shock* of the glottis.

There is yet another matter with which everyone who has had anything to do with stammerers is familiar—namely, that after they have once started they have usually no difficulty in any subsequent words uttered uninterruptedly in the same breath. The stammerer should therefore *dwell on an easy syllable, prolonging the vowel of it, and then tack on the remainder of the phrase as though it were one word, and without any interruption whatever.* If there be no easy syllable to start with, we must make it easy by preceding it with a little indefinite vowel sound.

I will bring this part of my subject to a close by mentioning a *few special remedies* for a *few special difficulties*. A stammerer frequently finds it impossible to pronounce the *w*. In that case, let him substitute *oo* for it, saying *oo-as* instead of *was*, *oo-ater* instead of *water*, *oo-ill* instead of *will*. Similar difficulty often arises with the *y* and the *u*. Here we must substitute an *ee* for the *y*, and precede

the *u* by an *ee*, thus: *ee-oung* instead of *young*, *ee-ot* instead of *yacht*, *ee-ooniverse* instead of *universe*. I may observe that this method is simply dividing the initial vowel into its component parts, and saying them separately with great distinction and deliberation.

Time Necessary for Cure

With regard to this matter it is impossible to lay down a hard-and-fast rule, as so much depends upon individual circumstances. But in most cases people expect a cure to be effected too quickly. The treatment of stammering, as I have shown, is a very complicated process, and can consequently not be accomplished in the short space of a few weeks. Experience has led me to decline the treatment of young stammerers unless they are placed under my immediate care and control for at least three months.

In all cases long-continued self-control and discipline are indispensable. The habit of many years cannot be permanently eradicated in a few months; and patients who resume their old ways as soon as the time of treatment has expired must not be surprised if they are again quickly conquered by their enemy.

Adults, having presumably greater self-control than young folks, are frequently able to do without guidance after a shorter period. They can continue

the exercises by themselves; but it should always be distinctly understood that they do this entirely on their own responsibility.

In conclusion I desire to express my dissent from those who affirm that stammerers are usually secretive, suspicious, sly, and deceptive. This has not been my experience in a single instance. I have found them, on the contrary, warm-hearted, affectionate, honourable, and keenly sensitive to kindness, and to interest manifested in the relief of their distressful malady, and I am happy in the possession of many attached friendships which have resulted from close association with speech-sufferers. At the same time I am not prepared to deny that there are cases in which stammering is combined with mental and moral obliquity.

While preparing this paper I have been once more impressed by the difficulty of making matters as clear in writing as by *vivâ voce* explanations. It is, in fact, impossible to substitute written for oral instruction on a complicated subject like stammering. No lasting results can be obtained without personal communication between the teacher and the stammerer. It is impossible to lay down rules which shall suit every case. Each one presents individual idiosyncrasies, and must be treated accordingly. There is no royal road to the cure of speech defects any more than there is a universal panacea for other ailments.

PART II

BY MRS. BEHNKE

PART II

THE last edition of the foregoing treatise on Stammering by my husband, the late Emil Behnke, having been exhausted, I have been urgently advised to issue my own observations, deduced from careful study of the subject, and from experience gained during the last sixteen years in the successful treatment of a very large number of cases of stammering.

The more I see of this distressing complaint, the more convinced I become of its curability in the majority of cases, given a scientific method, sufficient time, and the active and continued co-operation of the patient.

Stammering forms a bar to success in, or even admission to, the Army, the Navy, the Bar, the medical profession, the Church, scholastic and commercial work, and also to social intercourse. The misery of the sufferers is very great, and besides the handicap to their prospects in life, the injury to their dispositions and characters is incalculable.

The varieties of manifestation of the trouble are legion. Some stammerers make frightful grimaces, screwing up the mouth and eyes tightly, struggling

violently, getting red and purple in the face in the effort to speak. Others thrust out the tongue to an extraordinary length, standing with widely-opened mouth, hands clenched, body swaying to and fro, looking as if in a severe convulsive fit. In some the tongue and head are drawn to one side; in others, the head is thrown back. Occasionally a case is met with in which the saliva flows out of the open mouth. Others clench the teeth with great force, biting the tongue and inside of the cheeks, often causing blood to trickle down the chin. Some make a continuous, irregular, vocal sound, more like a low growl than a human voice, without being able to articulate a syllable; lashing out with arms and legs with force sufficient to knock down a strong man. Others, again, keep absolutely still, the face looking like a mask, unable to utter a sound.

A painful case of this silent battle was that of a fully qualified medical man. He had bought a good country practice, which he gradually lost through this silent stammer which no one understood, his inability to speak being put down to eccentricity or to "bad manners." He could always speak perfectly at the bedside of patients; but if a relative accompanied him from the sick-room anxious to hear his opinion on the child's illness, the unfortunate man could neither utter a syllable or make a movement, but stood gazing fixedly before him

till, vanquished in the silent struggle, he would rush out of the house unable to utter a single syllable. He ultimately had to give up his practice and leave the neighbourhood, and subsequently came to me for help in conquering this terrible drawback, which happily I was able to give him. I found the upper airways were considerably impeded by a growth which I advised him to have removed. This was done, and he afterwards made excellent progress, so much so that before long he was able to acquire another practice, and is doing very well.

Small wonder that stammerers become morbidly sensitive and refuse to mix at all in society, preferring the solitude of their own rooms to the mortification of being unable to converse; even contemplating suicide rather than endure continuance of life in such depressing conditions; but under proper treatment there are very few absolutely incurable cases.

CAUSES OF STAMMERING

I NOW proceed to enumerate and discuss more fully than was possible for my husband to do in the limits of a lecture some of the causes of stammering. Amongst them are: obstructions of the upper airways, heredity, imitation, mental shock, severe blows on the head, epilepsy, chorea, hysteria, spinal weakness, worms; and, as a contributory cause, public-school life.

OBSTRUCTION OF THE UPPER AIRWAYS

Affections of the mouth, throat, or nose, or any general morbid condition of the system which may be present, and which are exciting causes of stammering, or which may aggravate pre-existing habitual stammering, should be treated before speech treatment is commenced.

Inadequate breath-supply and absence of breath-control constitute a marked feature in the majority of cases, whether of children or adults. These deficiencies are, as a rule, traceable to certain physical conditions.

In looking over my cases recently, I found that out of one hundred, taken consecutively in the order

in which they came to me, seventy-nine had some sort of obstruction in the upper respiratory passages, such as adenoids, enlarged tonsils, chronic tonsilitis, elongated uvula, deflected septum encroaching on the nostril space, broken bone causing obstruction not only by its position, but also by the constant irritation it set up, leading to swelling and suppuration, post-nasal catarrh and polypus.

In the majority of these cases treatment had removed the obstruction before they came to me. Those whom I found to be suffering from any of these troubles I advised first to obtain medical aid. With the upper airways blocked, or even partially blocked, by such obstructions, the lungs were very inadequately supplied with air, and the type of breathing was "high chest" or clavicular.

In all instances the chest was badly developed, in many cases measuring from three to six inches less than their average. In some the general health was more or less "below par," a natural consequence of deficient supply of oxygen.

Case of Mechanical Blockage of the Nose causing Stammering

A singular and interesting confirmation of the theory that blockage of the upper respiratory passages is a potent cause of stammering, has been afforded me by the diagnosis of a case now under

my care. The patient, when quite a little child, pushed a button with a metal shank into her nostril. No one had seen the action, and the presence of the button was, for a long time, unsuspected. The child cried when her nose was wiped, and was unable properly to blow it, or to breathe through it. She snored, not only in sleep, but often when awake in the daytime. She became very ill, and was medically attended for six months without obtaining relief. Eventually the nose was examined, and the button was discovered and extracted. There was a good deal of inflammation and suppuration, which remained for a considerable time after the button was removed, causing the little patient to be very ill, and she began to stammer between the age of five and six years. The stammer remained, and continued during twenty-five years.

The case answered to treatment remarkably well. In fifteen days this lady obtained sufficient control over her breathing and vocal muscles to be able to prevent herself from stammering, whether in reading or in talking; and in another two or three weeks of steady, uninterrupted work the tendency was altogether overcome.

Here we have a case of artificially impeded nasal passages causing stammering, in much the same way that growths, such as adenoids and other

abnormalities, have caused it in hundreds of instances. Inquiries elicited the informaton that there was no history of the impediment on either side of the family, nor was there any association with a stammerer, whether nurse, companion, or relative; yet conditions always observed to exist in other cases were present in this. Neither heredity nor imitation was the cause of the trouble, and there appears to be no reason to suppose that the nerve centres controlling the muscle movements in speech were affected. The respiratory powers were, however, very deficient. When this lady commenced work with me, her lung capacity registered only 130 cubic inches; it should have been 209 cubic inches. In a fortnight she easily registered 164 cubic inches—a gain of 34.

The amount of chest expansion on the first day she came to me was only one inch; at the end of the fortnight's work it was three and a quarter inches, and her general appearance was healthier and brighter.

The case, and the result of its treatment, prove satisfactorily the correctness of the opinion that a most powerful factor in the causation of stammering is the existence of any sort of impediment in the nasal or post-nasal passages, interfering with the access of air to the lungs.

It also shows the necessity of properly directed

breathing exercises designed to suit each case, in order efficiently to re-establish the right muscle-habits, and to prevent the closing together again of those passages from which growths or other blockages have been removed, otherwise the advantage sought for by surgical measures may be nullified.

No persons should be entrusted to give these breathing exercises who have not a thorough knowledge of the physiology and anatomy of the parts concerned. They should possess the ability to devise exercises suitable for each individual patient. To treat all patients alike is to court failure.

In several instances of stammering in quite young children, when the diagnosis indicated the presence of obstruction of the upper airways, I have advised their being taken to a surgeon for its treatment or removal. This done in time—that is, as soon as the stammer begins to manifest itself—has in some cases effectually arrested the trouble. When the stammer has established itself as a habit, surgical treatment, while removing the exciting cause, cannot remove the result; it cannot create new speech habits. These have to be carefully and patiently formed by the sufferer under a thoroughly competent teacher.

Heredity

There seems to be reason to consider the existence of heredity as causing a tendency to stammer. It is, however, difficult to obtain accurate

information in some cases, on account of disinclination on the part of parents to admit the existence of the trouble in other members of the family; and one only hears accidentally that a grandfather, uncle, aunt, cousin, or other relative used to stammer. Some of these contracted the habit by imitation of the stammering relative; but there are many others who have never had communication with—or even seen—their stammering relatives. In these cases the question of imitation is eliminated, and that of heredity may be considered—heredity, that is to say, of the special neurotic condition noticeable in the majority of cases.

Among the records of my work during a given period—namely, four years—I find that in six cases the father stammered; in three, the mother; in four, an uncle; in one, an aunt; in three, girl-cousins; in one, the grandmother; in three, the grandfather. In one of these families four children stammered badly.

In another instance in which the grandfather stammered, in each of the families of his two sons and one daughter some of the children stammered, the trouble having skipped a generation and reappeared in the third generation. There seems, therefore, to be sufficient reason to consider heredity as a factor in this distressing complaint. Doubtless there were other hereditary stammerers among those who came to me for cure during those four years,

but I was not able to get reliable information about them. These cases are, as a rule, rather difficult to treat, and they are liable to a recurrence of the trouble if after being cured they are in constant association with members of their family who still stammer. There is a nervous instability in many of them, making it difficult for them always to hold themselves under control when speaking.

Imitation

This is an admitted cause of the trouble. One boy, who was brought to me, had acquired the habit through mocking the gardener, who stammered. His imitation was so excellent that he was constantly asked to give an exhibition of it for the amusement of friends, with the result that, after a time, he stammered worse than the gardener; and it was long before the family realised that it had become impossible for him to speak otherwise. He made excellent progress with me, and quite lost the defect.

Another lad was very fond of the groom, who stammered badly; and as he was always accompanied on his rides by the man, and as every minute of his playtime was, if possible, spent in the stables, he began to stammer. He came under my care after being turned down in his medical examination for the Army on account of his defect.

After being under treatment he went up again for examination, and passed without the least stammer.

In another case a girl was in the class of a governess who occasionally stammered. The girl soon spoke much worse than the teacher, and it was not without difficulty that she was cured. Many such instances might be quoted; but those given suffice to prove that imitation is a cause of stammering.

Mental Shock

A girl of eleven years of age was alone with her mother who died quite suddenly from heart failure. The girl received such a shock that for some hours she could not speak nor produce any vocal sound. By degrees she recovered her voice, but stammered horribly, with violent contortions. She was extremely shy and timid, dreading to stammer if she attempted to speak, and was becoming morbid about it. Great tact and care were necessary in treatment. Everything was done to improve the general health and the nervous condition, while also treating the speech defect. She ultimately spoke perfectly unless worried or anxious, or if her health was in bad condition, when there was a slight return of the stammer, which passed away again with renewed health and careful practice.

Constitutional Causes

In constitutional causes such as epilepsy, hysteria, some forms of chorea, locomotor ataxy, etc., the speech difficulty is but a symptom of a graver disorder, which it would be useless to attempt to benefit by treatment suitable for ordinary stammering. Complaints affecting the lungs and respiratory tract, notably the sequelæ of scarlet fever or measles; occasionally also influenza; whooping-cough, from the excessive strain on the diaphragm during severe paroxysms of coughing; debility and indigestion, are causes of stammering which call for medical, as well as elocutionary, assistance.

Public-School Life

Public-school life appears to be a serious difficulty for many boys who stammer, or who have a latent tendency to this trouble. Parents often say to me of their son: "He never stammered until he went to school"; or, "The stammer came back in a few weeks after he went to school." Head and assistant masters are not now impatient and harsh with the stammerer, as was formerly frequently the case; but it is impossible to keep a whole form at a standstill, time after time, for the answer which takes minutes instead of seconds to get out. The poor boy knows that the

class is waiting on his account; he is acutely sensitive and alive to the annoyance and to the gaze of his schoolfellows. He becomes hot, flustered, and angry that his difficulty makes him appear to be ignorant and unprepared with his work. The self-control necessary to apply the rules for speaking which he has learnt he is unable to use, and little by little the old bad speech habit reasserts itself. In these circumstances it is advisable to let the boy return from time to time for short courses with the teacher who has been successful in curing the stammer, or to place him with a tutor who only receives a few students at one time.

Nervous Origin

Stammerers and their friends often attribute the cause of the trouble to "nerves," because when the patient feels quite at ease with friends, or when at play, the difficulty vanishes entirely, while with strangers it is intensified. This sort of nervousness is not the origin of the trouble, for the dread and apprehension of stammering cannot have existed before the patient began to stammer. The mental attitude thus created, being once established, becomes a powerful contributing cause in the increase and continuance of the trouble in children and adults; but when a stammerer obtains the power to speak aright, that nervousness goes entirely.

As soon as a child begins to observe the difference in his speech from that of other children, especially if grimaces and contortions accompany his efforts to speak, he becomes self-conscious, dreads being spoken to and having to reply to a question; and the constant fear and apprehension act prejudicially on his mind. Mothers who designedly take no notice of the defect act in mistaken kindness. Children are usually very quick of apprehension, and soon perceive the desire to shield their faulty speaking from observation. This makes them try to do the same, and greatly increases their nervousness before strangers. It would be wiser to treat the stammer as an incorrect pronunciation would be treated: kindly and quietly pointing out the correct way, and getting the child to repeat the sentence slowly and clearly. Although the stammer might not be entirely removed thereby, many difficulties may be corrected thus, and the children would be saved from serious inconvenience afterwards.

Although nervousness in some instances is the *result* and not the *cause* of the trouble, stammering is undoubtedly of nervous origin in the majority of cases.

As my husband has said (see p. 5):

"The causes of stammering, not being local, must be sought in disturbed action of the nerve centres concerned in the production of speech. If

speech is to be perfect, there must be harmonious co-operation of the several mechanisms of respiration, phonation, and articulation, all of which are under the direct and immediate influence of that portion of the brain which is known as the 'bulb,' or the 'medulla oblongata,' where the centres of these mechanisms are situated close together."

The opinion has been expressed that the seat of the disturbances of the nerve centres governing speech is not in the medulla but in the cerebral cortex. The following quotation from a paper by Dr. W. S. Morrow, lecturer on physiology, M'Gill University, goes to support my husband's view that the *medulla* is the seat of the disturbance:

"There is a respiratory centre in the medulla which is divided physiologically into an inspiratory and an expiratory centre, so distinct from one another that either one may be affected by stimuli which fail to influence the other. These centres may or may not be able to act automatically, but they are in any case profoundly affected by nervous impulses reaching them from the brain above, and by various paths from below, especially by the pneumogastric nerves. The respiratory centres send their stimuli to the muscles of respiration by the ordinary spinal nerves such as the phrenics and intercostals."

This clear and scientific description enables us to

understand why control of the expiratory part of respiration in speaking is most difficult of acquirement by all stammerers, viz: because the expiratory centre is not, at the time, influenced by the stimuli which have affected the inspiratory centre. For this reason explosive speech, difficulties of commencement, repetition of vowels and of consonants may be traceable to spasmodic interruption of the stimuli from the nerve centres to the muscles of respiration, which, in their turn, act spasmodically, without control. This is also an explanation of the apparent anomaly noticeable in all stammerers, that at times they speak perfectly and at others are scarcely intelligible. We can also readily understand the reason why carefully designed and regulated breathing exercises react on the nerve centres and help to re-establish exact and instantaneous co-ordination with the vocal muscles. A similar result accrues in some cases of paralysis, in which the medical gymnast effects restoration of power by the use of massage and specially localised movements. These movements, upon which the patient is directed to concentrate, stimulate the brain centres, which in turn stimulate the nerves of the paralysed muscles, until by repeated stimulation normal, healthy action is re-established.

Even in cases of admittedly nervous origin the majority of the stammerers probably failed first in

breathing; the supply of air becoming less and less adequate for the purposes of speech and of health. The diminished supply of breath would cause lessening of the physical stimulation of the respiratory nerve centres; which stimulus would, in normal breathing, be conveyed by the action of the respiratory muscles. This diminution in the supply of nerve-stimulus soon induces incomplete control of the motor power of voice, which is breath; and resulting from these conditions, voice use becomes jerky and uncontrolled, and stammering is gradually established.

In an interesting and instructive article on "Defective Nasal Respiration,"* Dr. P. Watson Williams argues that "normal nasal breathing stimulates the bulbar respiratory centre"; and he considers that "abrogation of this physiological stimulation is one important factor resulting in deficient respiratory exchanges and consequent deficient metabolism." Thus the views on this subject held by the late Emil Behnke receive confirmation from the writings quoted above.

Speech Training

The teaching for cure of speech defect has hitherto been mainly based on the assumption that the fault lies in the *articulating* apparatus. Even medical

* *Bristol Medico-Chirurgical Journal*, March, 1906.

writers who have observed that faults of breathing are invariably found in all stammerers have failed to recognise that these respiratory errors are the *primary* cause of the defect; and they consequently proceed to prescribe treatment for the secondary cause—articulation. This occurs in Dr. John Wyllie's otherwise admirable work, *The Disorders of Speech*.

In his opening chapter he gives his opinion as follows:

"It will be the chief object of this paper to make it perfectly evident that the common defect of stammering is in the great majority of cases due to delayed action of the laryngeal mechanism, though it may, apparently in a minority of cases, be caused by delayed action of the oral mechanism."

On p. 16 Dr. Wyllie says: "The starting-point of the defect is want of promptitude in the production of the vocal element in the first syllable of words, . . . the radical defect in the stammerer being the absence or insufficient supply of the vocal element . . . the stammerer produces the letter voicelessly or with feeble or intermittent voice."

The above description is perfectly accurate as far as it goes; and it is much to be regretted that Dr. Wyllie has not gone to the root of the matter, but has taken the second position of stammering, the laryngeal, as its fundamental cause. We must go

further back in the formation of the voice to discover it, and must inquire into the *cause* of "the want of promptitude shown by the vocal mechanism," as Dr. Wyllie aptly expresses this condition.

What *is* "the vocal element" or voice?

Voice is breath converted into tone by the vibrations of the vocal ligaments or cords in the larynx; and it is in the inco-ordination of the breathing muscles with those of the vibrating element, delaying the production of tone, that the primary cause of stammering lies—not, as Dr. Wyllie states, in the laryngeal mechanism.

Stammering is less an articulatory defect than a breath and voice defect. The "silent sticks" of laryngeal origin of which Dr. Wyllie speaks are impossible of production while the stream of vocalised air is passing through the vocal gates. The stammerer must be taught to acquire control over his breathing muscles in speaking as complete as he has over the fingers of his hand, so that the continuity of the motor power of voice is assured.

If stammering were a delay of the laryngeal mechanism, or a speech defect, Dr. Wyllie's "Physiological Alphabet" would be invaluable in the cure of certain forms of the trouble. His study of the alphabet and analysis of the pronunciation of letters are excellent, and of great assistance where

articulatory defect exists; but in the majority of cases of stammering, the defect being due to wrong methods of breathing and of vocalisation, drill of the mechanism of articulation alone has very little practical use, and had better not be attempted. Exercises having as their basis the incessant repetition of those syllables and words which present a difficulty of pronunciation to the stammerer appear very often to increase, rather than to remove, or even to diminish, the difficulty, because they do not attack the *cause* of his speech obstruction. If, as is held by some writers on this subject, the flow of nervous energy lies along the line of consonant repetition, and if a man says b-b-b-b-bone, it is clearly evident that he is perfectly capable of saying the letter *b*, having repeated it five times. It is not drill on any initial consonant or vowel which will avail him. He gives himself, sorely against his will, constant drill in saying initial letters, aggravating his trouble. Instead, therefore, of encouraging this superfluity of nervous energy in a wrong direction, by insisting upon the practice of consonant repetition, it would surely be advisable to divert the overflow into another channel, as a first step towards stopping it.

Dr. Wyllie frequently refers to the necessity of attention to the production of the vocal element in speech, or, to quote exactly, "the vocal mechanism,

whose want of promptitude is the primary cause of the difficulty." It is matter for surprise that so accurate an observer should have overlooked the first and basic element in the production of voice—breath. He speaks of two mechanisms only—the laryngeal and the oral; whereas, in all speech three mechanisms are employed:

1*st*. That of breathing.

2*nd*. That of tone production in the larynx.

3*rd*. That of the oral or word-making.

Of these three mechanisms, faults of breathing are the primary cause of stammering, the laryngeal faults being secondary.

The following quotation from an article of mine which appeared in *Guy's Hospital Gazette* puts the matter clearly:

"The primary cause of stammering is want of co-ordination between the breath muscles and the vocal muscles; the one or the other lags behind. The harmonious working together of the mechanism of the voice being thereby interrupted, the nerve centres in the brain, which govern their movements, spasmodically fail to control them. The conditions are frequently aggravated, perhaps sometimes induced, by blockage of the post-nasal passages, impeding free intake of air. Such cases require medical aid before elocutionary treatment can be commenced. Exercises designed to re-establish the

exact and instantaneous co-ordination of the muscles are given; their continual practice reacts on the motor nerve centres in somewhat the same way in which gymnastics and massage act in certain cases of paralysis. But, as no two persons stammer alike, it is necessary carefully to study the idiosyncrasies of each case and to conquer individual differences before applying general principles. The various forms of *speech* obstruction appear to be reflex action, rarely requiring special attention, and disappearing as control is obtained over breath and voice."*

The opinion that laryngeal spasm is not the cause but the effect of the antagonism in the mechanisms of speech, is amply proved by the experience of many years of practical work in the cure of this complaint; the results having been attained mainly by giving attention to correct respiratory movements.

Spirometer Records

I have for many years kept records of the age, stature, vital capacity, and power of chest expansion before and after treatment. These records show that the vital capacity of stammerers is, in varying degree, always below their average; the chest girth and chest expansion being less by some

* Mrs. Behnke: *Guy's Hospital Gazette,* July, 1897.

inches than they should be for the age and height of each person; the breathing being markedly "high chest," or clavicular. This invariable inferiority of lung capacity and of chest girth in all cases of stammering, in patients of both sexes, of all ages, and of different nationalities, is a strong proof that errors of breathing are at the foundation of the trouble.

In order that my readers may judge this important point for themselves, I give below the records of the age, stature, lung capacity, and chest girth of one hundred patients, taken before and after treatment, in the order in which they came to me; fifty being women and girls, and fifty men and boys.

WOMEN AND GIRLS.

	Age.	Stature.		Breathing Capacity.			Chest Girth before Treatment.	Chest Girth after Treatment.	Increase.
				Lung Capacity before Treatment.	Lung Capacity after Treatment.	Increase in Lung Capacity.			
		Ft.	In.	Cubic In	Cubic In.	Cubic In.	Inches.	Inches.	Inches.
1	16¾	5	3¾	195	235	40	33	37	4
2	34	5	3	91	110	29	30	31⅞	1⅞
3	15½	5	4	74	134½	60½	26½	30	3½
4	28	5	7	60	203	143	34	37	3
5	16	5	4	132	146	14	31½	33¼	2¼
6	18	5	10	154	172	18	33	38	5
7	40	5	9½	113	159	49	28	31½	3½
8	22	5	3½	100	114	14	31½	34½	3
9	35	5	7¾	80	101	21	29½	32	2½
10	20	5	9	66	148	82	31¾	32¾	1
11	26	5	11	167	183	16	34	36	2
12	30	5	8¼	91	131	40	29½	31½	2
13	27	5	9	100	150	50	33¼	34	¾
14	17	5	5½	117	156	39	31¼	36¼	5
15	20	5	6¾	131	143	12	31½	33½	2
16	16	5	6½	108	160	52	27¼	30	2¾
17	13½	5	3¼	105	175	70	29½	32	2½
18	15	5	3½	74	121	47	26	28½	2½
19	30	5	5¼	107	169	62	28	29	1
20	29	5	3	64	110	46	29	29¾	¾
21	24	5	8	110	140	30	25	29	4
22	12	5	1	81	123	42	25½	27½	2
23	14	5	7½	150	176	26	30	32⅞	2⅞
24	30	5	8½	65	121	56	30	31¼	1¼
25	21	5	0½	57	139	88	28	30	2
26	23	5	7¾	151	175	44	30	33	3
27	29	5	9½	81	122	41	29½	32½	3
28	18	5	6	90	118	28	29	31	2
29	32	5	1	57	98	41	32¾	35	2¼
30	22	5	7	113	156	43	29	31½	2½
31	24	5	10½	149	203	54	32	34	2
32	25	5	3	55	123	68	29	32	3
33	46	4	11	61	93	32	27	51	4
34	36	5	4½	180	226	46	33	35¾	2¾
35	18	5	5	112	130	18	29	31¾	2¾
36	20	5	6½	81½	150½	69	31	34	3
37	16	5	7¾	40	172	132	28¾	34	5¼
38	21	5	6½	136	170	34	32½	35½	3
39	19	5	4½	135	180	30	30	32¼	2½

WOMEN AND GIRLS—*continued.*

	Age.	Stature.	Breathing Capacity.			Chest Girth before Treatment.	Chest Girth after Treatment.	Increase.
			Lung Capacity before Treatment.	Lung Capacity after Treatment.	Increase in Lung Capacity.			
		Ft. In.	Cubic In.	Cubic In.	Cubic In.	Inches.	Inches.	Inches.
40	28	5 10	130	164	34	29	30	1
41	16	5 8½	131	190	59	30	32½	2½
42	24	5 5	134	160	26	33	33½	½
43	31	5 7	80	144	64	31½	34	3½
44	24	—	100	143	43	29	33	4
45	28	5 3	160	210	50	34½	37	2½
46	13	4 9	107	140	33	28½	30½	2
47	32	—	98	131	33	—	—	—
48	54	—	145	160	15	33½	34½	1
49	22	5 10	122	180	58	34	36¼	2¼
50	30	5 7½	117	165	48	29	32⅛	3⅛

MEN AND BOYS.

	Age.	Stature.	Breathing Capacity.			Chest Girth before Treatment.	Chest Girth after Treatment.	Increase.
			Lung Capacity before Treatment.	Lung Capacity after Treatment.	Increase in Lung Capacity.			
		Ft. In.	Cubic In.	Cubic In.	Cubic In.	Inches.	Inches.	Inches.
1	16	5 5	194	351	57	31	35	4
2	12½	4 11	80	143	63	29	30½	1⅜
3	15	5 6¼	151	179	28	29	31¼	2⅛
4	17	5 9½	129	181	52	30½	34½	4
5	21	5 11½	205	235	30	35	38	3
6	20	5 8¼	180	225	45	33	36	3
7	17	5 2⅜	154	184	30	28⅜	32	3¼
8	18	6 2½	170	230	60	26½	29½	3
9	21	5 5	151	172	21	30	32	2
10	18	5 9½	137	164	27	26¼	29½	3¼
11	22	5 8	121	150	29	27	29½	2½

MEN AND BOYS—*continued.*

	Age.	Stature.	Breathing Capacity.			Chest Girth before Treatment.	Chest Girth after Treatment.	Increase.
			Lung Capacity before Treatment.	Lung Capacity after Treatment.	Increase in Lung Capacity.			
		Ft. In.	Cubic In.	Cubic In.	Cubic In.	Inches.	Inches.	Inches.
12	15	5 6	107	163	56	27½	29½	2
13	18	5 7	148	180	68	31¾	35	3¼
14	9	4 2	80	101	21	25½	28½	3
15	25	5 11	123	146	23	30	32	2
16	15	5 7½	102	162	60	30¾	33¼	3½
17	21	6 3	195	290	95	32¼	34½	2¼
18	13¾	5 6½	139	172	33	29	32½	3½
19	17	5 7	160	190	30	29½	31½	2
20	26	5 11	230	285	55	36	38½	2½
21	15	5 4	144	166	22	29¾	31¾	2
22	18	6 0	158	208	50	34	36½	2½
23	15	4 8¾	84	116	32	26½	38½	2
24	12	4 8⅝	96	128	32	27	30	3
25	12	4 10½	82	145	63	27½	30	2½
26	12	4 5½	58	84	26	26½	27½	1
27	24	5 11	48	211	163	29	33	4
28	15	5 1½	141	162½	21½	30	35½	5½
29	22	5 11½	160	204	44	39	41½	2½
30	22	5 9	210	234	24	29	34	5
31	33	5 11	150	255	105	33	37	4
32	48	5 11	213	270	57	—	—	4
33	24	6 0½	210	279	69	—	—	3½
34	25	5 4½	184	207	23	37	38	1
35	19	6 1½	194	230	36	28	32	4
36	12	4 7½	81	116	35	26¼	27½	1¼
37	17	5 11	138	207	69	32	33½	1½
38	21	5 8½	182	205½	21½	31	33	2
39	15	5 6½	124	201½	77½	29	31½	2½
40	26	5 8½	200	253	53	32	35	3
41	42	6 0	254	262	8	29¾	32¼	3½
42	29	6 3	294	304	10	32	34	2
43	39	5 4	179	191	12	31	34	3
44	41	5 9½	160	209	49	31½	34¾	3¼
45	22	5 6½	145	155	10	29	31½	2½
46	20	5 9	190	220	30	29½	32	2½
47	21	6 0	206	224	18	30	33	3
48	21	6 0½	126	249	123	33	35¾	2¾
49	19	6 1	72	188	116	33	35	2
50	24	6 0	136	200	64	33½	35½	2

In the first table the ages of the female patients were from 9 years to 54 years old.

Breathing capacity was from 51 cubic inches, the lowest, to 195, the highest.

The gain in lung capacity was from 12 cubic inches to 143 cubic inches.

The increase in chest girth was from ¾-inch to 5½ inches.

In the second table the ages of males when commencing treatment were from 9 years to 48 years old.

Breathing capacity was from 48 cubic inches, the lowest, to 294, the highest.

The gain in lung capacity was from 8 cubic inches to 163 cubic inches.

The increase in chest girth was from 1 inch to 5½ inches. The patient who made the largest increase of lung capacity was a medical man, who stammered so badly that it was impossible for him to take a practice. When he commenced studying with me his lung capacity was only 48 cubic inches, but in a few weeks it had increased to 211 cubic inches. His chest girth also increased 4 inches. Before coming to me he had practised articulation drill for two years, with no good results to his speech.

All the measurements of breathing were taken on the same instrument, and the chest girth with a surgical tape measure.

The comparison of lung capacity on commence-

ment of treatment with the increase at the end of it, shows undoubtedly that the breathing of stammerers is very deficient. Their difficulties of speaking disappear as the breath capacity and control increase; another proof that the primary cause of the stammer lies in the respiratory mechanism, and not in the vocal or oral mechanism.

The increase in chest girth in every patient is worthy of attention for reasons other than stammering. The improvement was not confined to the *youth* of both sexes; for in males the ages of the recorded cases were from 9 years to 48 years, and in females from 9 years to 54 years. The results were obtained, for the most part, in about eight weeks, and in a few cases in a fortnight, the improvement in physique and in general health being marked. Army officers have frequently observed that the use of similar exercises would be an invaluable assistance in drilling their men.

There is no doubt of their value for all classes and for all ages, if given by an experienced and judicious teacher.

The correctness of the opinion that the primary cause of the stammer lies in the respiratory mechanism, and not in the vocal or the oral mechanism, is further demonstrated by the tracings of the pneumograph. For the use of this instrument I am indebted to one of my pupils, Dr. Worthington,

who kindly endeavoured to find me some means by which I could test the amount of contraction requisite for the large breathing-muscle—the diaphragm—for the purpose of my work. The instrument showed the extent of the movement, and also recorded irregularities and stoppages of the respiratory mechanism, giving a diaphragmatic picture of the checks and stops of voice which actually take place in a stammerer.

Action of Breathing Muscles as shown by the X-Rays

A few years ago, being desirous of obtaining some ocular demonstration of the actual movements of the great breathing muscle—the diaphragm—and of the intercostal muscles, my daughter and I made observations with the X-rays :*

1*st*. In ordinary passive, automatic, natural breathing.

2*nd*. In the larger requirements of voluntary active breathing for tone-making, for use in speaking and reciting, and in the greater effort to fill a large hall.

3*rd*. In singing simple tones and phrases, in long sustained notes, in rapid passages of different duration, and in staccato passages.

4*th*. In stammering.

* *The Speaking Voice*, Behnke. Curwen and Sons.

The main object of the investigation was to ascertain if any fresh light or new fact could be deduced from it which would be of assistance in voice training; or, on the other hand, whether the accepted scientific views on the all-important matter of breath-taking and breath-control were contradicted in any particular. The result showed their entire correctness.

It was quite easy to see the raising and widening of the lower part of the thorax corresponding to the expansion of the lungs as the air gradually filled them, more or less, according to the amount of air inhaled. If the air was exhaled slowly, as in normal breathing, the diaphragm gently ascended, the thorax slowly returned to its former position, and the lungs to their former size.

When voice use was commenced the wonderful regulating and controlling power of the breathing muscles, the diaphragm and lower costals, was evident; at times, by will of the demonstrator, giving out the air column so slowly and gently that the muscles seemed hardly to move at all, while in a *forte* passage the return action was much stronger and the muscle tension greater.

When the demonstrator, instead of controlling the exit of the breath by the great breathing muscles, used the muscles of the upper chest and throat, the voice, whether in speaking or in singing, at once

became "breathy" with occasional false intonation, and the tones became thinner and poorer in quality.

In the production of *staccato* tones a short, distinct upward jerk of the diaphragm, with a corresponding abrupt movement in the lower thoracic walls, was seen.

Passing on to the examination of stammerers—proceeding thus to the comparison of normal with abnormal breathing—we found that the X-rays fully confirmed the accuracy of our view that stammering is mainly due to faulty action and failure of co-ordination of the breathing and voice muscles.

Diaphragmatic spasm and irregularities of the respiratory mechanism were clearly seen, thus corroborating the results of the pneumograph described in the previous pages.

The Curability of Stammering

Is stammering curable?

Undoubtedly it is curable under right conditions in all but a very few cases, such as those in which there is idiocy, lunacy, or epilepsy.

It must be clearly understood that the carrying of the cure of this distressful complaint to a successful issue lies in the hands of the stammerer himself. The teacher's work is to show him what to do, and to train him until he is thoroughly and practically acquainted with the method necessary

for his special case. This training should always be continued until there is no more difficulty in reading or talking under any circumstances. When this has been achieved and lessons are discontinued, the rest of the work lies with the stammerer himself. If he is negligent in carrying out the rules for controlling his speech which he has been taught, he will, sooner or later, have a relapse, however perfectly he may have spoken before leaving his instructor. It will be well if this fact is recognised, not only by all persons so afflicted, but also by their relatives and friends. The patient will then fully understand that continued success in speaking depends upon the continuation of the method in which he has been trained, together with the control he voluntarily exerts over himself.

Age is no bar to cure. I have had patients from the age of five—the youngest—to the age of eighty-one—the eldest. Very young children, if bad stammerers, have not sufficient determination or self-control to be able to help themselves; and as the cure requires the active, intelligent co-operation of the patients, it is usually better to defer treatment until they can themselves apply the rules given for their assistance. Some children are much more advanced than others; these may begin quite young, especially if they have become conscious of the drawback their difficulty is to them, and are

desirous of getting rid of it. Some of the quickest cures have been effected in people of middle age, and in some who were considerably beyond it. Patience, perseverance, and conscientiousness in following the directions given are essential; fortunately these qualities can be commanded, or can be acquired, by every adult.

Cleft-Palate Speech

Next in importance to stammering comes the distressing, imperfect vocalisation and articulation caused by the deformity called Cleft Palate.

The elocutionary treatment in these cases is the most difficult of all work for the correction of speech disorders. The difficulties are mainly due to the conditions which exist in the nasal passages above the palate, after the fissure in the hard palate has been united; they also greatly interfere with the resonance of the voice as well as with articulation. One contributory cause is the high position of the hard palate in the mouth; it encroaches upon and crowds the lower part of the air passages, of which it forms the floor, where the largest portion of breath passes; narrowing the air-space, and reducing to a minimum the co-vibration of the air in these chambers with the vocalised air in the mouth. It is probable that a considerable amount of feebleness and want of development remains in the upper air-

ways and in the naso-pharynx after the operation for closure of the palate, interfering greatly with the *timbre* of the voice and with the articulation of many letters and syllables, causing the snuffling, hollow sound which is so marked a feature in cleft-palate speech.

Great improvement is effected by breathing exercises, which are specially devised to reach these parts via the nose; the repeated passage of large amounts of air through these partially blocked upper airways exerts a favourable stimulus on the respiratory tract, and helps to establish a healthy state of the nasal and pharyngeal passages. It is absolutely necessary to insist on breath being taken only through the nose. This is somewhat difficult at first to many of these patients; but a little perseverance will soon make it easy.

Another prominent feature in cleft-palate speech is nasality of tone. It is distinct from snuffling, but both are usually present, although sometimes the one defective sound, sometimes the other, may predominate. The nasality is caused by an imperfect and immobile soft palate; and to the same cause we may, in a measure, attribute some of the poor quality of voice which is generally to be noticed in these cases. The fissure usually extends from the hard palate through the soft palate, completely dividing it; but sometimes it is confined to the

latter part only, and the operation of uniting it often causes some amount of thickening and a resulting want of elasticity. Even when there is no thickening, the soft palate becomes semiparetic, through loss of the influence which nasal breathing exerts on its mobility.

Sufferers from this trouble are as seriously handicapped by the disagreeable vocal and articulatory difficulties following on cleft palate as are stammerers by their difficulties of speech, perhaps even more so; but they usually show very little nervousness or disinclination to talk, and appear not to realise the unpleasantness of their speech; while stammerers generally dread to talk, and remain silent as much as possible.

From experience with the speech education of a number of these patients, I find that the best results are obtained with those in whom the operative treatment for closing the palates is performed as early as possible. Very much depends on the completeness of the closure in both palates, not only for success in articulation, but also in voice.

A girl who was sent to me by her doctor was not operated on for closure of the cleft palate until she was fifteen years old; and she was not brought to me for treatment of the speech difficulty until she was nineteen years old. It had been impossible entirely to close the hard palate; an aperture as

large as a pea had been left in the centre of the roof of the mouth, through which the air taken into the nose came into the mouth, thence finding its way through the larynx and windpipe into the lungs. This was not only a serious hindrance to aeration of the naso-pharynx by breathing exercises, but also to the correct pronunciation of several letters; and it was impossible entirely to overcome the nasality which is one of the characteristics of these cases. By the careful employment of various devices for obtaining control over the articulatory processes, much improvement was effected; but if the operation on the palate had been performed in early childhood, it would probably have been possible to close the cleft completely, and the speech would have greatly benefited thereby.

In contrast to this is the case of another girl, now in her nineteenth year, who can speak so well that no one can detect the slightest abnormality in voice or in articulation. The palate was beautifully united in childhood, and she was sent to me by her doctor when about eight years old. She took lessons regularly for a year, afterwards coming again occasionally if her parents thought there was a little falling-off in her speaking.

There is great difficulty in speech education whenever the cleft is left unclosed until the patient

has reached thirteen or fourteen years of age; the best results being obtainable if the closure is effected quite early in childhood, and the elocutionary work commenced at about eight years of age.

The surgical treatment of cleft palate has made great advances of late years. The symmetry of the mouth is rendered more nearly perfect than formerly by the greater skill and experience of the operators. This makes it possible to do much more on the elocutionary side of the work. The teacher must, however, carefully notice all divergences from the normal in the internal configuration of the mouth; and when these divergences are such as to interfere with clear speech careful study is required in order to suggest adaptations of mouth positions for the correct pronunciations of those letters and words which are unintelligibly pronounced owing to the malformations.

Occasionally, in closing the upper jaw, a space is unavoidably left where a tooth should have come, making it impossible to get the true sound of certain letters, as *s*, *c* soft, *sh*, and *z*. A single artificial tooth can sometimes be inserted to fill the vacant space, with excellent results on the pronunciation of those letters. It happens occasionally that the missing tooth comes through into the middle of the hard palate, interfering greatly with almost every

word the patient says, making the tongue rough and sore, and the speech quite unintelligible to strangers. In some recent cases of mine this happened; and I had a little difficulty in persuading the parents to allow a dentist accustomed to such cases to extract the tooth. After its removal each child made excellent progress in speaking clearly and distinctly.

When there is entire absence of the soft palate, it is advisable to have an artificial one of thin, pliable gutta-percha, attached to a small dental plate. This arrangement has answered very well, with some of my patients, for nearly all letters but hard *g*, the closure for that letter taking place a little lower down in the throat than the artificial velum can reach. When there is only a portion of the soft palate—also when it is slightly paretic, stiff, and immovable—exercises must be given to overcome the difficulties of these conditions, care being taken never to continue the practice to the point of local fatigue.

If there has been hare-lip as well as cleft palate—the fissure extending along the whole of the hard palate, severing the upper jaw and also the upper lip—the lip is sometimes a little shortened by the operation for closing it; or the muscles are inelastic and stiff. In this condition the pronunciation of labials, *b*, *p*, and *m*, is the most unfavourably

affected; *w* and *y*, as pronounced in the alphabet, are difficult in a lesser degree.

But the greatest difficulties to overcome are the snuffling, the nasality, the absence of nasal resonance, and the pronunciation of the throatal letters *k*, *q*, and *c* and *g* hard. All of these troubles are the result of the undeveloped condition of the upper respiratory passages, and in particular of the naso-pharynx; and also of an imperfect soft palate and uvula, which latter are not sufficiently mobile to fulfil their work of closing off the nasal passages from the mouth, and of assisting in the articulation of the letters mentioned above.

Nasal tone is caused by the vocalised air going out through the nose instead of through the mouth. I am aware that many persons hold a precisely opposite opinion; but the truth is so easily demonstrated that anyone can satisfy himself on the subject without special knowledge. For example:

"Close the nostrils completely, and sing *ah*, when you will find you can produce pure vocal tone. Or try this experiment: Take a thin mirror and hold it flat against the upper lip with the glass upwards. Sing a pure vocal tone, and the mirror will remain perfectly bright. Sing, on the contrary, with nasal quality, and the mirror will at once be completely dimmed. This shows conclusively that nasal sound is produced by singing *through* the

nose, and this cannot be done without lowering the soft palate."*

In cleft-palate cases the soft palate is always more or less inelastic and immovable. In its normal state this little movable partition acts like a curtain. We can drop it on the back of the tongue, thereby compelling the tone to pass through the nose, and thus giving it nasal quality. This nasal quality increases the more the passages through which the tone has to travel are impeded. Raise the soft palate, and you may completely shut the nostrils and yet produce a pure vocal tone; because with the soft palate *up*, the nose is shut off from the throat, thereby compelling the tone to pass through the mouth.

It is this absence of the action of the soft palate in cases of cleft palate which causes the nasality. Sometimes there is very little of the soft palate left after the operation, and it is too short completely to shut off the nose from the throat. In others the edges are very thick, and occasionally the closing seam has destroyed its power of movement; but it is astonishing what can be done by educative measures to restore its functions.

In the educational work for voice and speech in cleft-palate cases, it must always be remembered that "use brings function"; therefore no pains

* *Mechanism of the Human Voice,* 18th edition, p. 60, Behnke.

should be spared to devise exercises which shall bring about the power of using the various muscles employed in voice and speech in a manner as nearly as possible approaching to that which is natural to persons unafflicted with cleft palate and its results. The sort and degree of movement requisite will probably vary with each patient—at least, this has been my own experience; but it is extremely interesting to watch the growth of facility in using the different muscles, and their adaptability for unaccustomed use. Nature is wonderfully accommodating if we know how to manage her.

Lalling

Lalling is the name given to the unintelligible, imperfectly formed efforts at speaking of little children. It is also used to designate the imperfect speech of imbeciles. Sometimes these imperfections of speech are retained long after the time when the child should have spoken the words in its limited vocabulary clearly. It is then the duty of its parents to ascertain the cause of this delay in speech development. It may be the result of malformation of the throat, tongue, or mouth, or of word-deafness, which latter trouble would prevent the child from hearing the pronunciations of some words with sufficient clearness to imitate them.

Grown-up people who are much with the child

should invariably speak with accuracy and distinctness, employing simple words as far as possible; and they should use every endeavour to teach the little one to speak correctly, never imitating its "baby talk." Why should the poor child be put to the trouble of first learning this "baby talk" and afterwards having to learn entirely different words for the same object? For instance, gee-gee for horse; moo-cow for cow; baa-lamb for lamb; bow-wow for dog, and so on. Each of those "baby-words" is a dissyllable, requiring two movements of the voice and of the articulatory processes to produce it; yet, when learnt, the child finds that the animal he has been taught to call a gee-gee is a horse, and so on, to the confusion of his little brain.

When lalling proceeds from imbecility, the child should be placed under the care of a medical practitioner who specialises in such cases.

Lisping

Lisping is an imperfect way of pronouncing the letter *s*, usually occasioned by wrong position of the tongue; sometimes also by defective shape of the hard palate. In the simple and commonest form of lisping the sound *th* is substituted for *s*, because the tip of the tongue is put either between the upper and lower teeth or against them. In a few cases, the frænum, or muscle of attachment of the tongue

to the bottom of the mouth, is too short to permit of raising the tip of the tongue sufficiently high to reach the proper position against the roof of the mouth for *s*. If exercises for stretching the cartilage and making it pliant fail in their object, it will then be necessary to call in the aid of a surgeon to snip the muscle so as to allow freer movement of the tongue. When this little cut has quite healed, daily practice in the right pronunciation of the letter will overcome the habit. It is easy to correct this sort of lisp in childhood; but some parents think the child "will grow out of it," and they take no trouble in the matter; therefore the habit increases, and gives much trouble in after years. The lisp frequently commences at the time of shedding the first teeth, when a gap is left in front of the mouth, through which the tip of the tongue protrudes in the endeavour to say *s;* it becomes almost impossible not to substitute *th* for *s*, as *thay* for *say*, *yeth* for *yes*, etc. The habit being thus formed, it is necessary to watch the effect of the second teeth on the mispronunciation. Sometimes the lisp rights itself, but it often remains, unless definitely corrected.

The tip of the tongue should not touch the teeth or gums in saying a pure *s*. The front of the tongue becomes spoon-shaped, with the tip a little depressed, and the edges at the sides slightly turned up, just as in a dessert-spoon. These turned-up edges

touch the upper gum close against the teeth; the breath is thus forced into the narrow groove between the turned-up edges of the tongue, and the hissing sound of *s* is made. It is more or less acute and sharp, or dull and muffled, according to the extent of approximation of the edges of the tongue against the gums. The *s* sound can be made peculiarly aggressive and unpleasant; and as it is constantly recurrent in our language, it is worth taking trouble to learn to say it well. A very little patience and perseverance will enable anyone to conquer this sort of lisp, unless it is caused by malformation of the mouth, such as abnormal height of the palate, or its narrowness, or to faulty position or absence of teeth. Even with these drawbacks, it is often possible to acquire correct pronunciation of the letter.

The other form of lisping is caused by sending the breath forcibly through the side teeth, causing a disagreeable, bubbling sound. The tongue, in these cases, is generally too thick and too large for the mouth. Various exercises which I have devised for acquiring control of the tongue and for reducing its size are described in *The Speaking Voice** and have proved very useful; but this sort of lisp takes much longer to eradicate than the first one described, and can seldom be overcome without special exercises.

* Mrs. Emil-Behnke, 10th edition. Curwen and Sons.

One of our bishops refused ordination to a candidate on account of this aggressive, bubbling lisp. The Principal of the young man's college asked me to see what I could do to remove the trouble. Fortunately the lisper was most intelligent and persevering in carrying out instructions, and in three weeks could pronounce every *s* perfectly. He has since been ordained, and has had no recurrence of the difficulty.

There are many minor forms of speech disorders, such as the substitution of *w* for *r*, or forming the *r* with the root of the tongue instead of with the tip; the substitution of *v* for *th*, as *farver* for *father*, *wiv* for *with;* dropping the final *g*—as lazy and bad a habit as dropping the *h*—and so on. But the worst of all is the horrible mispronunciation of the vowels heard amongst the populace of our large towns, as disagreeable to hear as cleft-palate speech. These being faults of careless pronunciation rather than defects of speech, do not require detailed explanation, and, moreover, are fully dealt with in *The Speaking Voice*.

PART III

BY KATE EMIL-BEHNKE

PART III

From a lifetime of intimate association with the treatment of stammering emerges the unmistakable fact that, be the contributory factors in stammering what they may, its root cause, in all except such as is acquired by imitation, is to be found in some nervous derangement. This may be a matter of inherited neuropathic tendency; or of definite nervous instability; or it may have been caused by some shock to the nervous system. But it is improbable that such shock would have induced stammering had not the sufferer been of a neuropathic constitution; and it is equally improbable that any of the factors mentioned in the foregoing pages—bars though they are to cure, and essential as is their removal to ensure a successful issue of speech treatment—would have contributed to stammering without the nervous diathesis.

Thus stammering must be regarded as a nervous disorder, and every effort must be made to reach the psychic causes, tranquillise and stabilise the nervous system, and treat the stammer by breathing exercises and re-education of the muscles of speech. No greater mistake could be made than, on the one hand, to treat the stammerers with harshness or

severity, or, on the other hand, to ignore the trouble and expect that the sufferer will grow out of it. For one who does so there will be ninety-nine who do not, and for whom life will be little short of misery in consequence. Systematic treatment must be carried out, hygienic conditions of life insisted upon and the general health carefully watched and any departure from the normal attended to without delay. It is extraordinary what a variety of causes not seeming to have the least connection with stammering may act as contributory or exciting factors, either in starting it in the first place, or tending to a return of it if the general health be not kept up to the mark.

In many cases that have come under my notice stammering has commenced in childhood after an illness, such as whooping-cough or measles, and in some instances asthma is stated to have caused it, The association of asthma and stammering constitutes the most difficult class of case to deal with. Much depends of course on how bad the nervous factor is, and also upon the degree of emphysema and spasm which exists. In many such cases, however, not only has the stammer been entirely overcome, but the asthma has also benefited materially through the breathing exercises and treatment of the general nervous conditions.

In a recent case of mine, that of a girl of sixteen,

a bad stammer commenced in childhood after acute colitis. Diaphragmatic spasm and tremor were very marked, with great difficulty in words beginning with consonants. Speech, even when the patient spoke without stammering, was extremely jerky, and the stammer was accompanied by considerable grimacing, the tongue frequently being rolled out in a condition of spasm and contortion. A curious feature of the case was that there was little or no apparent nervous factor, the stammering seeming to have been caused solely by the upset to the system of unusually acute colitis. There was also a slight lateral spinal curvature with marked rigidity in the lower dorsal and upper lumbar regions, and considerable lack of balance and muscular co-ordination. These physical irregularities were attended to by a medical gymnast while the speech treatment was being carried out, and the results were in every way most excellent.

Spinal Irregularities

I find some form of spinal curvature in 80 per cent. of my cases, very frequently accompanied by knock knees and flat feet; and even when there is no lateral curvature there is more often than not a marked lordosis with rigidity in the lower dorsal and upper lumbar vertebræ. I am quite convinced by long observation of such cases that this rigidity

has a bearing on nerve tension and irritation in relation to stammering which it is impossible to over-estimate, and my view is confirmed by the gain in ease and freedom, with corresponding benefit to the speech, when this is corrected. Knock knees and flat feet, with their concomitant of faulty distribution of weight, also contribute materially to, and in some cases are the primary cause of, the faulty balance and general lack of co-ordination so frequently found in stammerers; while the flattened ribs in scoliosis, impeding as they do expansion of one lung, and bringing about torsion of the diaphragm, are amongst the causes of the characteristic spasmodic irregular breathing of the stammerer. In some cases I have found that a depressed sternum has been a serious factor in the stammer.

An instance of this was the child of a medical man, a boy of nine and a half, who stammered so badly as to be absolutely unintelligible to all but his own people, and whose efforts to speak were so great as to leave him completely exhausted. The sternum was so much depressed that a good-sized walnut could be placed in the cavity—great pressure was caused on the heart, with consequent considerable degree of cyanosis. By means of carefully graded breathing exercises the depressed sternum was gradually corrected, and as the respiratory power developed and spasm ceased the stammer was

overcome. The boy, who was undersized and poorly developed, then commenced to make normal growth.

I find it more satisfactory to have any medical gymnastic treatment that may be required for such cases carried out under my immediate supervision, in close co-operation with my treatment of the speech defect, and I have for some time had a medical gymnast working in conjunction with me for this purpose. Even where there is nothing in the nature of spinal or other definite physical irregularity I find that in most cases medical gymnastics are of great value in combination with the speech treatment. Balance and general co-ordination of movements are usually faulty in stammerers; the jerkiness and lack of rhythm which are characteristic of their speech being more often than not also found in all their physical activities; and the establishing of correct speech habits—the result of delicate complex co-ordination of many different types of muscle actions, which we are practically unconscious of when they are functioning normally—is materially assisted by graded resistive movements and training in co-ordination and balance.

Mental Shock or Fright

Stammering is more frequently the result of shock or fright in childhood than is usually recognised, and is the most difficult type to overcome.

Parents are often unaware that any shock has occurred, the fact only coming to light after a lapse of time; and they are therefore completely at a loss to understand the sudden development of a stammer. Under these circumstances the tendency is to expect the stammer to depart as suddenly as it came, whereas the longer treatment is deferred the more deeply rooted does the trouble become. Moreover, where it has been caused by a shock of any kind an apprehensive habit of mind in the sufferer becomes established, and not only does this exist in relation to the stammering itself, but apprehension of disaster of any kind, of bodily injury, acute distress at sudden noise, are also frequently present, and any mischance that may befall the stammerer will cause bad fits of stammering.

An interesting case of stammering that developed after an accident was that of a boy who fell out of a window, a drop of some thirty feet, on to hard ground. He had concussion of the brain, was for a considerable time unconscious, and on recovering consciousness commenced to stammer violently. The stammer became habitual, though varying in intensity, always being worse under any conditions of nervousness.

Before the accident he was apparently quite normal in every way, and in the opinion of his relatives not of a nervous disposition. This view, how-

ever, must be accepted with reserve, as in early childhood a nervous diathesis is not always recognised unless circumstances arise which bring the child under expert observation.

In this case not only was the action of the muscles of respiration and articulation spasmodic in the extreme, but muscle action in general was spasmodic, balance and co-ordination were very poor, and he was quite incapable of carrying out any smooth slow movements.

Had the psychic factor been treated when the stammer first developed after the accident, on the lines of the psychotherapy which has been so successful in shell shock, the trouble would probably have been overcome; but the too prevalent idea was acted upon that the boy would grow out of it, instead of which by the time he was brought to me, some four years later, he had *grown into it:* nervous apprehension in general had assumed formidable proportions, and incorrect, jerky muscle action had become firmly established. One or two attempts had been made by ordinary elocution lessons to improve the speech as the boy grew older, when the relatives realised that he was not " growing out of " the stammer, attempts foredoomed to failure unless the psychic factors were also treated and certain adverse physical conditions attended to. The latter I found to be not inconsiderable, consisting of a

deflected nasal septum, latent spinal curvature, wing scapulæ, a bad rigid lordosis, knock knees and flat feet.

The nasal obstruction was by my advice surgically corrected, and the boy found considerable relief in his speech therefrom, but the relatives did not see their way to having the other matters attended to while he was under me for his stammer, taking the view, against my advice, that it would be time enough for this to be corrected by the school medical gymnast when he left me. Subsequent events fully demonstrated the unwisdom of this decision. All the muscular movements of ordinary daily activities were so jerky and erratic as to render very difficult, if not actually impossible, acquirement of the controlled breathing, and co-ordinated rhythmic action of the finer muscle work that go to produce speech.

This was proved by the fact that, whereas he was able to speak perfectly when lying down, or when sitting in a correct position with the weight supported in a reclining chair, he stammered violently when attempting to talk whilst walking or standing.

His treatment with me was brought to a premature close by the sudden death of a near relative, and he went to public school still under the handicap of his stammer.

There is little doubt that, had medical gymnastic treatment been combined with the speech training,

as I advised, the trouble would have been completely eradicated even in the much reduced time he was with me.

I mention this case because I do not think it is sufficiently realised how many possible contributory factors there may be in stammering which *must* be attended to, either before or during the speech training (according to the nature of the particular factor) in order to ensure success.

Another case of stammering following nervous shock was that of a girl of sixteen who had developed the trouble after fright occasioned at the age of five and a half by a tramp snatching a locket from her neck. She stammered badly to strangers, and to her own people in moments of excitement. I found here a slight nasal obstruction, so slight that I did not anticipate it would be any factor in the stammer, and as her parents feared the effect of a visit to a surgeon on her extremely nervous temperament, I decided to commence speech treatment without seeking medical aid first—as is my custom in such cases. Her progress, however, did not satisfy me and my advice was then followed and the nasal obstruction removed, after which the stammer yielded satisfactorily to the speech treatment.

It is certainly extraordinary how slight a pathological condition may hinder success, but my experience confirms this time after time. Even an

elongated uvula may be a sufficient adverse factor, and frequently when it has been thought unnecessary to have it shortened and subsequently it has been decided during the course of treatment with me to have it attended to, the gain in freedom of speech and ability to respond to the exercises has been immediate and unmistakable.

The Effect of the War

The effect of the war upon children is common knowledge. Even here in England, where the privations were infinitesimal compared with those endured on the Continent, the results physically from insufficient vitamines, fats, sugars, etc., were obvious; but who shall estimate the effects on the nervous system of a child, of the anxiety and anguish of its mother, and of actual nerve shock from air raids?

Who can estimate how far-reaching may be the effect upon young children roused from sleep again and again, often many nights in succession, and taken downstairs to shiver with anticipation of the deadly shattering terror that approached: to say nothing of the hundreds who nightly slept hour after hour in the fœtid atmosphere of the Tubes? Who that saw this can doubt that the results nervously must be incalculable and possibly ineffaceable?

I had many cases of stammer in children directly caused by air raid shock, and found them always accompanied by a high degree of nervousness and nervous apprehension.

Apart from actual causation of stammer, there is no doubt that even outside the air raid areas the anguish and nervous tension that the whole nation was living under reacted on the children, and I think we are far from having lived it down yet. Certainly in my work in connection with the treatment of speech defects, I find a much higher degree of nervousness than formerly.

Hopes have been entertained that the psychotherapy which was found so successful in the treatment of shell shock would be equally successful in the treatment of stammering in general, but in the main these hopes have not, I think, been realised.

Where a stammer, caused by shock, can be treated soon after it manifests itself, before wrong muscle action has become established, this would clearly be the right method to adopt, but where breathing is insufficient or spasmodic, and where co-ordination is faulty, muscle re-education and patient training in rhythmic co-ordination will be necessary. Naturally psychic re-education will be equally necessary, but cure cannot be expected from this alone where wrong muscle action has become a

habit. It is a mistake, in my opinion, to deduce that only the psychic element requires treatment because in so many cases a person who stammers badly at times will speak on other occasions without stammering. If the speech of a stammerer be analysed, it will be found in most cases, even when he is at his best, always to have in it the *elements* of the defect; that is, faulty respiration, jerky delivery, and unduly short vowels. It only requires the spark to the magazine of nervousness or excitement to convert this into a stammer.

Influence of Prevailing Habits of Speech

It is, therefore, not sufficient to be satisfied with removing the stammer; really good speech habits must be acquired and the stammerer's tone perceptions must be awakened. He must aim not merely to speak as well as most normal persons but a great deal better. He must take a pride in speaking his own language beautifully and must not be content with the slipshod clipped mutilation of our noble English that prevails.

The Auto-suggestion of the New Nancy School must without doubt be materially assisted in its application to stammering by the high standard of speech that obtains in France. Continuity of tone—that *sine quâ non* for the stammerer—is automatically ensured by the *liaison*, and further reinforced

by nasal resonance, which is absolutely inherent in the French language, and conspicuous by its absence from the English language, or rather, from the English language "as she is spoke."

The subconscious mind of the Frenchman has registered good speech, and, moreover, speech of the kind most calculated to assist in overcoming a stammer. This fact should be borne in mind when results obtained by the New Nancy School in this respect are being considered.

Undoubtedly the careless, slovenly speech which is heard on all sides in England makes it much more difficult for a stammerer to conquer his defect than it need be. All those associated with him should do their best to speak deliberately, smoothly, and distinctly. They can in this way render great assistance.

It is further very wise that after the speech defect has been overcome the stammerer should take up the study of singing or elocution, preferably, if possible, under the same teacher who has treated the stammer. In this way control is obtained of the muscles used in the production of the voice which will be invaluable and which will give him the confidence born of knowledge and the sureness arising from trained muscles which by systematic exercise have been brought under the control of the brain and consequently will no longer be liable to

be upset in their correct functioning by any assaults of nervousnesss.

Confidence will still further be established as the pupil progresses in his study of *normal* voice use by discovering that he can give pleasure by performance—which the teacher will encourage him to do—a change in his whole attitude towards life in association with his fellow-men the psychic bearing of which is impossible to over-estimate.

General Health

It is essential to attend to the general health of a stammerer. "Coddling" or fussing should be avoided, but healthy conditions of life must be insisted on. Plenty of exercise in the open air, plenty of sleep, avoidance of late hours, crowded rooms and excitement, these are all essential. A careful diet should be carried out. Rich foods should be avoided and meat should be taken in moderation; indeed, some stammerers do better on fish in place of meat. "Sloppy" foods, rich puddings and pastry should be avoided, and starch food in general should be cut down as much as possible. Sweets—particularly chocolates—should not be permitted; condiments, pickles, sauces and the like are better avoided altogether. Wine and spirits should never be taken; tea and coffee sparingly, and not strong. Mastication should be thorough.

Stammerers, as is so frequently the case with nervous persons, are inclined to bolt their food, and the resultant indigestion upsets breath control. A bad attack of indigestion has frequently caused a relapse in a stammerer.

A diet rich in vitamines is essential, and a good plan is to make one meal a day as far as possible of uncooked foods such as wholemeal bread and cheese, salad—with good olive oil and lemon juice instead of vinegar—and plenty of fresh fruit. Raisins or honey can be taken at this meal. These give the necessary sugar in an easily assimilable form, and are valuable nerve foods. For adults such a meal would be best at midday, and it will be found that it is much easier to work after than after a meal of cooked foods. For children, whose chief meal is usually the midday one, it will probably be best as the last meal of the day. Nervous children will sleep more quietly and be less likely to dream after a meal of " raw " foods such as these than after one of cooked foods.

Hurry and worry should be avoided. Stammerers should not lie in bed in the morning till the last minute and then dress in violent haste, go to breakfast late and discomposed, bolt their meal, and rush off to work. The whole day goes wrong, and many a bout of bad stammering has its origin in an early morning scramble. A stammerer should always

feel that he has ample time for everything that he has to do. Few things are more likely to upset his self-control than the feeling that he is keeping others waiting, either in speech or action.

Undoubtedly an outdoor life is best, and where this is not possible, recreation should be in the form of outdoor amusements. Exercise should be taken in all weathers, and not only should Saturdays and Sundays be spent in the open air, but a daily walk throughout the week should be insisted upon. Young people who go into business on leaving school, or take up work of a sedentary nature, frequently suffer very much from the cessation of regular outdoor games, and a great deal might be done to counteract this by forming the habit of walking part of the way to and from work. Whenever possible the walk should be through park or recreation grounds, or along the Embankment, or where no such open spaces are available, quiet by-streets should be chosen rather than the crowded, noisy main streets.

Influence of Noise upon the Nervous System

I have long been convinced that noise has a very prejudicial effect on the nervous system, and I have frequently noted its adverse influence on stammerers of a nervous type. It is, therefore, of interest to mention that this view has recently been corroborated

scientifically. It used to be thought that people became accustomed to noise, but it has now been demonstrated that we actually expend nervous energy in "refusing to hear." Instruments have been devised which give approximate values for the energy expended in *not hearing* noises of various kinds, from which it is clear that dwellers in large towns are perpetually expending nerve force in this way unnecessarily. This naturally reacts seriously on those who are of a nervous disposition, added to which, in the case of stammerers, is the actual expenditure of physical effort in trying to speak against noise. Some idea will be formed of this wastage of energy when it is recalled how loudly people coming to the country from towns are noticed to be speaking when they first arrive. It is also noticed that they cannot at first rest. They rush about feverishly, making excursions, seeing sights, and so forth, and frequently only after several days can they relax and rest.

The *noise* of the screeching shell and the *thunder* of the big guns were as great a factor in the shattering of the morale as the fear of bodily injury.

So we see that where stammering is of nervous origin, everything in the daily life of the individual which has an adverse influence on the nervous condition must be legislated for.

Importance of Establishing Good Conditions of Life

It by no means follows that this necessarily means a life of deprivation, still less that it implies a constant "fuss," or conscious arrangement, of what is or is not permissible. Where the patient is a child, or in early youth, the parents or guardians can for the most part control, or at least improve materially, the conditions of life; and in the case of an adult, or one old enough to realise the drawback of stammering, there will be every incentive to co-operate in avoiding everything which may be prejudicial to cure, and reward soon comes, not only in overcoming the stammer, but in the increase of well-being, of capacity for enjoyment, of self-control and competence due to a higher degree of nervous stability.

Treatment

There is nothing to add to what has been said in Parts I. and II. on the matter of the treatment of stammering. It is not possible to give more than an outline of the general principles. Their application must necessarily vary in accordance with the history, nature of the trouble, and nervous condition of the individual, and it is useless to expect that directions for cure can be given in a book or by

correspondence. It is essentially a matter for personal instruction, and in many cases the close co-operation will be required of medical man, medical gymnast, and speech specialist.

Stress has purposely been laid on the bearing of the nervous condition, and of any adverse health conditions, upon stammering in order to combat the still too prevalent view that the patient will "grow out" of the trouble, or that he could speak properly if he were not "careless." It is incredible to anyone who, like myself, is concerned with the treatment of this distressing malady that either view should be entertained, particularly where the position and education of the parents are such as to warrant the expectation of better judgment, as in two cases which recently came under my notice.

The first was the son of a medical man, an intelligent boy of 12½ years of age. His father, medical man though he was, took the view that because at times the lad spoke without stammering, he could, if he exercised care, do so always, and he had only been deterred by his wife's entreaties from attempting to "thrash it out of him." It was due to her insistence that my opinion was sought. The child's highly nervous condition was to me so patent that it was difficult to believe that it could escape *lay* observation, much less that of the father who was a medical man. Despite everything I could

say, however, the boy was not placed under treatment, the father adhering to his view and maintaining that the boy was merely careless and could speak properly if he chose.

The result of such an attitude is shown in the second case.

A lad of about 17, who had just left school, had wished to enter a civil employment (an employment of his own choice for which he had been keenly desirous for several years). A medical examination was necessary, and he was "turned down" on account of his stammer. His parents then got him into an office in the City, where they thought his speech trouble would be no bar.

At the conclusion of his first week there he was "sacked," his employer stating that there was no fault whatever to be found with him in the carrying out of his duties, but that his stammer made it impossible to keep him. In this case the opinion had been expressed in childhood that the boy would "grow out" of the trouble. It probably could have been quite easily dealt with then, whereas in the meantime wrong speech habits had been established, nervousness had increased, and self-confidence fatally wrecked at the onset of entry into the world by two such knock-down blows. It will readily be understood what long and patient work would be needed for the joint business of speech

re-education and establishment of nervous equilibrium and confidence in such a case.

Age in Relation to Treatment

This brings us to the consideration of what is the best age for treatment, the conditions necessary for success, and the time it is likely to take.

The first thing to be realised is that no hard and fast rules can be laid down. Individual circumstances vary so widely that each case must be considered on its own merits.

Undoubtedly expert advice should be sought the moment stammering shows itself. If dealt with at once it may at once be eliminated. In early childhood, while control of the body is still being acquired, and its habits are not yet fully automatic—habits which later in life give us so much trouble to alter—the matter may be fairly simple. Particularly important is it that it shall be attended to without delay if the stammer has been induced by any nerve shock. A wise psychic handling when the trouble first arises may not only prevent the stammer from becoming established, but may prevent the development of nerve trouble, the ramifications of which may be incalculable.

If advice can be obtained at once the trouble may be arrested. On the other hand, treatment in childhood may have to be carried over a very con-

siderable period of time, or short courses may be needed at intervals. In some cases, when the matter has not been attended to in the first place, it may be wiser to defer treatment till the child is old enough to realise the drawback of stammering, and will, therefore, bring active will-power and co-operation to the treatment. This is a factor of the highest importance in overcoming the trouble, and can only be considered negligible in earliest childhood. Cure *may* be accomplished in a comparatively short time in adult life by reason of the greater degree of concentration and determination which is brought to bear by the stammerer, but this is no argument for omitting to treat the trouble in childhood.

Education is obviously hindered by such a handicap, not to mention the fact that there is a growing tendency on the part of school authorities to decline to take a stammerer into the school at all. It is to be hoped in the interest of stammerers that this tendency will become universal, for the trouble will then of necessity be treated, as would any other remediable illness or physical disability. And this brings me to a very important point.

Conditions Necessary for Cure

When treatment is decided upon a stammerer's whole time should be given up to it and to the

establishing of the necessary health conditions. Parents must realise that the success and happiness of the whole future may depend on the complete eradication of the trouble, and to talk about "sacrificing education" by withdrawing a child from school for this purpose is sheer nonsense. Education will proceed very differently when the handicap of the stammer is removed. The laments I hear from adult stammerers on the hiatuses in their education, owing to their trouble, would surprise many who take this view.

A child must either be withdrawn from school till the trouble is overcome, or it must be treated in the holidays. It is easy to see that there are practical objections to both these courses, and it may be expedient to adopt a compromise—viz., to withdraw the child from school for a term on first commencing treatment, and then to take holiday courses until the trouble is completely overcome. In most cases the school authorities must be asked to arrange for practice to be carried on at school, and, where time and distance permit, it may be desirable that the pupil should visit the speech specialist once or twice weekly during the term, an arrangement which will help to prevent a relapse under the rather adverse conditions for a stammerer of school life. It is also very wise for the school authorities thus to be in touch with the speech specialist, for relapse can in

this way frequently be prevented. To give an illustration of my meaning, a public-school boy commenced to stammer again after being rather badly damaged in a football "scrum." In another case the nerve shock of an injury in the carpenter's workshop brought about a return of the trouble, which in short holiday courses I was able completely to remove.

There are two fixed points in a boy's career when, if stammering has not already been treated, a prolonged course should be undertaken; or when, if it has already been treated, a course should again be taken if there be the least trace still existing—viz., between leaving the preparatory school and going to public school, and on leaving public school before going to University or embarking on his career.

Nevertheless, should adult years have been reached without the stammerer having been treated, no one need think it is too late. In my experience the trouble is curable at any age, and always with great gain in general health and happiness.

Undoubtedly it is best, not only in childhood but also in adult life, for the stammerer's whole time to be devoted absolutely to the lessons and practice. No one would expect to carry on education, profession, or business while undergoing treatment for, say, gout at Harrogate. Why should such a thing

be expected in regard to stammering, particularly when it has been long established?

Daily lessons give the best results, and though the trouble may be—and is—curable where these are not possible, I find that cure is almost invariably accomplished in a considerably smaller number of lessons when they can be taken daily. Co-operation at home in the practice and application of the rules is most desirable, and will materially speed up the cure. In the case of children it is essential, and even in adults such assistance is of great value. One young man who was working in London and had little opportunity for practice in talking owing to his being in lodgings, brought at my request a friend with him to his lessons who devoted all his spare time to helping him in his practice and reminding him of the rules in talking, with admirable and speedy results.

Stammering in Several Members of a Family

When more than one member of a family stammers each should be treated, either separately or together as seems the more desirable.

A child whose father or mother stammers will find it very difficult to overcome the trouble unless the parent's stammer is also treated, and I have had most excellent results in several instances by taking parent and child together.

Conclusion

In the foregoing pages the most serious of the disorders of speech have been considered and their treatment indicated. As has been stated, it is not possible to give rules for every patient, because no two persons are alike in their defects, whether of stammering, cleft-palate speech, or lisping. Each case must be treated individually according to its special requirements. In all cases patient perseverance is a necessity in order to remove bad muscle habits and to form new and correct ones. Exercises must be systematised and regularly performed every day until the spasmodic, irregular movements of the various muscles involved in breathing and vocalisation have been entirely overcome. No efforts can be too great to make for the purpose of conquering the serious drawback to success in life which stammering causes; and sufferers from this trouble should be much encouraged by the knowledge that it is extremely rare to meet with an incurable case.

No one need despair, and even if cure takes some considerable time it is best to make the effort. Moreover, great mental relief is experienced from the moment treatment is commenced from the mere fact that something is being done to alleviate such a terrible nerve strain.

Let no one take a pessimistic view of the possibilities of cure from the difficulties enumerated in the preceding pages, or the time that may be needed to overcome them.

That they *can* be overcome in the majority of cases is certain, and that the attempt *should* be made is equally certain, for the sake of the sufferer, for the sake of those with whom he is associated, and last, but not least, for the sake of his or her possible descendants.

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